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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/683,374	12/19/2001	John C. Chappell	3383.1	7705

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EXAMINER	
FORMAN, BETTY J	
ART UNIT	**PAPER NUMBER**
1634	

DATE MAILED: 03/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

HC

Office Action Summary	Application No.	Applicant(s)	
	09/683,374	CHAPPELL, JOHN C.	
	Examiner	Art Unit	
	BJ Forman	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-54* is/are pending in the application.

4a) Of the above claim(s) *15-52* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14 53-54* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 May 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, Claims 1-14 and 53-54 in the reply filed on 23 December 2004 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Information Disclosure Statement

2. The references listed Information Disclosure Statements have been reviewed and considered as indicated on the initialed 1449s. DE WO 00/69553 is a non-English language document containing an English language abstract. As noted on the 1449, only the abstract has been reviewed. However, it is noted that U.S. Patent No. 6,819,843 is the national stage for the DE document. As such, the '843 patent is considered an English language translation of the DE document.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 5-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 5-14 are indefinite in Claim 5 because the claim is drawn to a method of synthesizing arrays of biological probes, but the method does not recite steps of synthesis,

arrays or biological probes. Therefore, it is unclear whether the steps accomplish the claimed method.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-3, 5-14 and 53 are rejected under 35 U.S.C. 102(b) as being anticipated by Gao, et al (WO 99/41007, published 19 August 1999).

Regarding Claim 1, Gao et al disclose a method for synthesizing a nucleic acid probe array (Abstract) comprising providing a substrate, providing photo-protected nucleotides, directing light onto a plurality of optical transfer elements (mirror), selectively switching the elements between light-passing and non-passing in response to gating data (i.e. predetermined light pattern, page 19, lines 16-17), disposing light thorough optical transfer element (i.e. light directed through the digital micromirror device, page 30, lines 4-13) onto the substrate to

provide a reactive group and contacting the nucleotides with the reactive group (page 5, line 22-page 6, line 2; page 19, line 9-page 21, line 12; page 39, lines 14-24; and Claims 16-17).

Regarding Claim 2, Gao et al disclose the method wherein the light is passed though at least one transfer element in the light-passing state to strike a selected first portion of the substrate thereby activating the portions (page 31, lines 6-14).

Regarding Claim 3, Gao et al disclose the method wherein the light includes ultraviolet (page 5, line 4 and page 30, lines 17-18).

Regarding Claim 5, Gao et al disclose a method for synthesizing one or more arrays of biological probes comprising, directing light onto one or more optical transfer elements, selectively switching the elements between light-passing and non-passing in response to gating data (light pattern) and disposing light thorough optical transfer element (i.e. light directed through the digital micromirror device, page 30, lines 4-13) onto the substrate (page 5, line 22-page 6, line 2; page 19, line 9-page 21, line 12; page 39, lines 14-24; and Claims 16-17).

Regarding Claim 6, Gao et al disclose the method further comprising activating selected portions of the substrate (page 19, lines 16-24).

Regarding Claim 7, Gao et al disclose the method wherein light passed through the transfer element strikes a first set of selected portions thereby activating the portions (page 19, lines 16-24).

Regarding Claim 8, Gao et al disclose the method further comprising providing linker molecules on the substrate including photo-removable protecting groups wherein activating includes exposing the protecting groups to light thereby exposing reactive functional groups (page 19, line 9-page 21, line 12).

Regarding Claim 9, Gao et al disclose the method further comprising contacting the exposed functional groups with monomers (page 20, line 20-page 21, line 12).

Regarding Claim 10, Gao et al disclose the method wherein the monomers include nucleotides, amino acids or saccharides (Abstract, page 6, lines 20 and page 8, lines 2-5).

Regarding Claim 11, Gao et al disclose the method wherein the monomer include a reactive functional group protected by a photoprotective group (page 12, lines 11-24 and page 19, line 9-page 21).

Regarding Claim 12, Gao et al disclose the method wherein light passed though at least one optical transfer element strikes a second set of selected portions thereby activating the portions and contacting with a second monomer (page 20, lines 6-18).

Regarding Claim 13, Gao et al disclose the method further comprising deactivating selected portions (i.e. addition of the monomer deactivates the portion, page 19, line 24-page 20, line 5).

Regarding Claim 14, Gao et al disclose the method wherein light passed through the optical element deactivates selected portions (i.e. in the presence of protected monomers or capping agents and their coupling to the reactive group, the portion is deactivated, page 19, line 24-page 20, line 12).

Regarding Claim 53, Gao et al disclose the array made by the method of Claim 5 (Example VIII, page 49, line 15-page 50, line 10 and Fig. 19).

7. Claims 1-7, 13 and 53 are rejected under 35 U.S.C. 102(a) as being anticipated by Braun et al (WO 00/69553, published 23 November 2000). The passages of Braun cited below are from the English language translation i.e. U.S. Patent No. 6,819,843.

Regarding Claim 1, Braun et al disclose a method for synthesizing a nucleic acid probe array comprising providing a substrate, providing photo-protected nucleotides, directing light onto a plurality of optical transfer elements, selectively switching the elements between light-passing and non-passing in response to gating data (i.e. controlled exposure pattern, Column 4, line 58-Column 5, line 57), disposing light thorough optical transfer element onto the

substrate to provide a reactive group and contacting the nucleotides with the reactive group (Claim 17).

Regarding Claim 2, Braun et al disclose the method wherein the light is passed though at least one transfer element in the light-passing state to strike a selected first portion of the substrate thereby activating the portions (Column 3, line 63-Column 4, line 8).

Regarding Claim 3, Braun et al disclose the method wherein the light includes ultraviolet (Column 3, lines 23-34).

Regarding Claim 4, Braun et al disclose the method wherein the transfer element includes an optical fiber (Column 3, lines 25-27).

Regarding Claim 5, Braun et al disclose a method for synthesizing a nucleic acid probe array comprising, directing light onto one or more optical transfer elements, selectively switching the elements between light-passing and non-passing in response to gating data (i.e. controlled exposure pattern, Column 4, line 58-Column 5, line 57) and disposing light thorough optical transfer element onto the substrate (Claim 17).

Regarding Claim 6, Braun et al disclose the method further comprising activating selected portions of the substrate (Column 3, line 62-Column 4, line 8).

Regarding Claim 7, Braun et al disclose the method wherein light passed through the transfer element strikes a first set of selected portions thereby activating the portions (Column 3, line 63-Column 4, line 8).

Regarding Claim 13, Braun et al disclose the method further comprising deactivating selected portions (i.e. light to the selected portion is turned off, masked or blocked, Column 4, line 58-Column 5, line 57)

Regarding Claim 53, Braun et al disclose the array made by the method of Claim 5 (Column 3, line 63-Column 4, line 8).

8. Claims 5-9, 11-14 and 53 are rejected under 35 U.S.C. 102(e) as being anticipated by Adams et al (U.S. Patent No. 6,156,494, filed 28 October 1997).

Regarding Claim 5, Adams et al disclose a method for synthesizing arrays comprising, directing light onto one or more optical transfer elements, selectively switching the elements between light-passing and non-passing and disposing light thorough optical transfer element onto the substrate (Column 5, lines 13-48 and Claims 1 and 27-29).

Regarding Claim 6, Adams et al disclose the method further comprising activating selected portions of the substrate (Column 5, lines 13-48).

Regarding Claim 7, Adams et al disclose the method wherein light passed through the transfer element strikes a first set of selected portions thereby activating the portions (Column 5, lines 13-48).

Regarding Claim 8, Adams et al disclose the method further comprising providing linker molecules including photo-removable protecting groups (Column 6, lines 35-41).

Regarding Claim 9, Adams et al disclose the method further comprising contacting the functional groups with first monomer (i.e. "Y", Column 7, line 53-Column 8, line 14).

Regarding Claim 11, Adams et al disclose the method wherein the monomer includes a photo-removable protecting group (e.g. Column 12, lines 12-26).

Regarding Claim 12, Adams et al disclose the method wherein light passed though at least one optical transfer element strikes a second set of selected portions thereby activating the portions and contacting with a second monomer (Column 5, lines 13-48 and Claims 27-29).

Regarding Claim 13, Adams et al disclose the method further comprising deactivating selected portions (i.e. at step (d) light activations forms a covalent bond between the first immobilized component and second component, Claim 1, step (d).

Regarding Claim 14, Adams et al disclose the method wherein light passed through the transfer element, strikes a portion to deactivate the portion (i.e. at step (d) light activations

forms a covalent bond between the first immobilized component and second component, Claim 1, step (d).

Regarding Claim 53, Adams et al disclose the array made by the method of Claim 5 (Column 13, lines 40-67).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gao, et al (WO 99/41007, published 19 August 1999) in view of Adams et al (U.S. Patent No. 6,156,494, filed 28 October 1997).

Regarding Claim 4, Gao et al teach the method for synthesizing a nucleic acid probe array (Abstract) comprising providing a substrate, providing photo-protected nucleotides, directing light onto a plurality of optical transfer elements (mirror), selectively switching the elements between light-passing and non-passing in response to gating data (i.e. predetermined light pattern, page 19, lines 16-17), disposing light thorough optical transfer element (i.e. light directed through the digital micromirror device, page 30, lines 4-13) onto the substrate to provide a reactive group and contacting the nucleotides with the reactive group (page 5, line 22-page 6, line 2; page 19, line 9-page 21, line 12; page 39, lines 14-24; and Claims 16-17)

wherein the optical transfer element is a digital micromirror device (page 30, lines 4-13). They do not teach the transfer element includes an optical fiber. However, optical fiber transfer elements were well known in the art at the time the claimed invention was made as taught by Adams et al.

Adams et al teach a similar method for synthesizing arrays comprising, directing light onto one or more optical transfer elements, selectively switching the elements between light-passing and non-passing and disposing light thorough optical transfer element onto the substrate (Column 5, lines 13-48 and Claims 1 and 27-29) wherein the preferred transfer element is a fiber optic because the fiber optic facilitates delivery of light energy to reactants on the surface (Column 3, lines 40-46 and Column 5, lines 2-8). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the fiber optic element to the surface activation of Gao et al for the expected benefit of facilitating delivery of light energy to the reactants as taught by Adams et al (Column 3, lines 40-46 and Column 5, lines 2-8).

11. Claim 54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gao, et al (WO 99/41007, published 19 August 1999) in view of Schembri et al (U.S. Patent No. 6,518, 056, filed 27 April 1999).

Regarding Claim 54, Gao et al teach the array made by the method of Claim 5 (Example VIII, page 49, line 15-page 50, line 10 and Fig. 19) and they further teach the arrays are custom-made (page 29, lines 10-11) but they are silent regarding the steps of making the custom-made arrays. However, custom-made arrays made according to customer specified data was well known in the art at the time the claimed invention was made as taught by Schembri et al who specifically teach this facilitates "experiment on demand" research (Column

15, lines 52-63). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the customer data taught by Schembri et al to the custom arrays of Gao et al for the economy of array production and facilitation of manufacturing as taught by Schembri et al (Column 15, lines 33-35 and 52-63).

12. Claims 1-4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adams et al (U.S. Patent No. 6,156,494, filed 28 October 1997) in view of Fodor et al (WO 92/10092, published 25 June 1992).

Regarding Claims 1 and 10, Adams et al disclose a method for synthesizing arrays comprising, directing light onto one or more optical transfer elements, selectively switching the elements between light-passing and non-passing and disposing light thorough optical transfer element onto the substrate (Column 5, lines 13-48 and Claims 1 and 27-29) wherein the method is used to provide an array of combinatorial libraries on a support (Column 3, line 65-Column 4, line 23). Adams et al do not specifically teach the steps of providing photo-protected nucleotides and contacting them with deprotected reactive site on the support. However, Adams et al specifically define their synthesis of combinatorial libraries as those encompassed by Fodor et al WO 92/10092 (Column 1, lines 51-56) which clearly suggests a preferred application of their method is the synthesis of nucleic acid arrays using the synthesis steps taught by Fodor. Fodor et al teach the claimed steps of providing photo-protected nucleotides and contacting them with deprotected reactive site on the support (Abstract and Fig. 1). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the nucleic acid combinatorial library synthesis steps of Fodor et al to the arrayed synthesis of Adams et al based on the explicit suggestion to do so in the teachings of Adams et al (Column 1, lines 51-56).

Regarding Claim 2, Adams et al disclose the method wherein the light is passed though at least one transfer element in the light-passing state to strike a selected first portion of the substrate thereby activating the portions (Column 4, lines 1-23 and Claim 1).

Regarding Claim 3, Adams et al disclose the method wherein the light includes ultraviolet (Column 17, lines 61-67).

Regarding Claim 4, Adams et al disclose the method wherein the transfer element includes an optical fiber (Abstract).

13. Claim 54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Adams et al (U.S. Patent No. 6,156,494, filed 28 October 1997) in view of Schembri et al (U.S. Patent No. 6,518, 056, filed 27 April 1999).

Regarding Claim 54, Adams et al teach the array made by the method of Claim 5 (Column 13, lines 40-67) but they do not teach using customer-specific data to produce the arrays. However, custom-made arrays made according to customer specified data was well known in the art at the time the claimed invention was made as taught by Schembri et al who specifically teach this facilitates "experiment on demand" research (Column 15, lines 52-63). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the customer data taught by Schembri et al to the arrays of Adams et al for the economy of experiment-specific array production and facilitation of manufacturing as taught by Schembri et al (Column 15, lines 33-35 and 52-63).

Conclusion

14. No claim is allowed.

15. The examiner and Art Unit for this application have changed. Please address future correspondence to BJ Forman, Art Unit: 1634.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (571) 272-0741. The examiner can normally be reached on 6:00 TO 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jones can be reached on (571) 272-0745. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

Patent applicants with problems or questions regarding electronic images that can be viewed in the Patent Application Information Retrieval system (PAIR) can now contact the USPTO's Patent Electronic Business Center (Patent EBC) for assistance. Representatives are available to answer your questions daily from 6 am to midnight (EST). The toll free number is (866) 217-9197. When calling please have your application serial or patent number, the type of document you are having an image problem with, the number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet. The USPTO's PAIR system provides Internet-based access to patent application status and history information. It also enables applicants to view the scanned images of their own application file folder(s) as well as general patent information available to the public.

For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.

BJ Forman, Ph.D.
Primary Examiner
Art Unit: 1634
March 3, 2005